

occurs in almost every suitable locality from the level of the floor of the Cirque, up to the Port de Gavarnie, that is, from about 5400ft. to 7500ft. It is not easy to distinguish on the wing from *E. stygne*, which was extremely abundant, but the two are not as a rule found flying together. *E. lefebvrei* confines itself almost entirely to the very steep scree, which does not facilitate its capture, whereas *E. stygne*, though it frequents the ground on either side of such a scree, is not found actually on the scree, unless it be flying casually across it. *E. lefebvrei* does not as a rule take long flights, unless disturbed, but flutters up and down the scree, pitching at frequent intervals on the stones. Apparently, however, it is very sensitive to sound, and it is, therefore, exceedingly difficult to approach. The habits just described are those of the ♂ only; the ♀ is less active, and is found on the rough ground at the foot of the scree. The majority of the specimens have the fulvous patch containing the ocelli on the upperside front wing fairly well developed; but in many it is reduced, and in some it is absent, so that the specimen is uniformly black. Such a specimen, fresh, and with the white pupils well developed, is indeed a magnificent insect. *E. tyndarus* var. *dromus*, *E. lappona* var. *sthemmo*, and (as already mentioned) *E. epiphron* var. *pyrenaica*, were the other Erebias of interest at Gavarnie. *E. gorgone* was not yet out.

Amongst species taken at Gavarnie on this occasion, but not in 1907, were *Parnassius mnemosyne* and *Melitaea didyma*. An unexpected capture, at a height of 6000ft., was *Klugia (Thecla) spini*.

On July 10th, one of us made an expedition into Spain by the Port de Gavarnie, spending two nights at the auberge in the Val d'Arras. In the lower part of this valley he found *Melanargia lachesis*, and higher up, some fresh specimens of *Glancopsyche melanops*. He took one specimen of the latter species at a height of 6000ft.

On July 16th we moved on to Biarritz, and renewed our search for *Heteropterus morpheus*, on the margins of the Lac de Mouriscot, and in the swamp near the railway station. In 1907 we took a single specimen only. This time we were more successful, though the species was still by no means plentiful. *Coenonympha oedipus*, on the other hand, was fully out and abundant. A curious sexual character in this species is the line above the ocellations on the underside of the hindwing. In the ♀ this line is conspicuous, and always shows a metallic glaze similar to that of the ante-marginal line; in the ♂ it is usually absent, or, if present, always without the glaze. In both sexes, the ocellations on the underside of the front wing vary considerably in number, and in some ♂s they are altogether wanting. In one ♂ that we took the ocellations on the hindwing are white-pupilled on the upperside. In the same locality *Enodia dryas* and *Epinephele tithonus* were abundant and in fine condition; *Thymelicus acteon*, *Eceres argiades*, and *Pararge aegeria* (type) were getting over. We did not see any specimens of *Lampides boeticus*.

Reflections on the phylogenetics of the Pyrameid group.

By G. T. BETHUNE-BAKER, F.L.S., F.Z.S.

The basis of the thoughtful paper on this subject (*antea*, pp. 62, *et seq.*), by Mr. Reuss is apparently that both *Pyrameis cardui* and *P. atalanta* are regular migrants. Is this a fact? We have abundant evidence

of sporadic migration, but regular migration is a different thing. What evidence have we of it?

We are told that *P. kershawi* from Australia and New Zealand is the atavistic form, and again, that *P. carye* from South America is nearer the generic prototype—which of the two are we to consider as nearer the prototype, and is the assumption correct? Ocellated spots are not usually considered atavistic—are they not an advance on the less intricate pattern of the supposed generic prototype? Hence it follows that blue pupilled eyespots are rather a recent acquisition than an atavism.

It is interesting to note that the blue-centred spots in *P. cardui* are spreading all over America, well up north. I have specimens from many parts of Canada, British Columbia, Manitoba, Montreal, and elsewhere, and we are not surprised when New Zealand specimens show a similar line of development. There are evidently factors in those parts of the world that are favourable to the evolution of this feature, which apparently do not obtain in the Eastern Hemisphere generally. These blue ocellated specimens are stated in the paper we are discussing to occur *solely* in the Sandwich Isles, but this is incorrect, both forms fly there.

It is of interest to remember that, in Madeira, where migration scarcely comes in, no special form has developed. I say where migration scarcely comes in, my old friend, Mr. Wollaston, who lived there for years, and was also constantly to and fro, never saw one of those periodic migrations, and I had another entomological correspondent there in recent years who never reported such an occurrence to me, though we were constantly writing on kindred matters to each other. This raises the point stated by Mr. Reuss that dark forms as from Lapland are induced by cold, and light forms by heat. This I must again query. I have a short series of *P. cardui* from the Island of Nias, fine large specimens which are as dark as any examples I know of, except possibly those small specimens where all the markings are compressed into a very limited area—the fact is that moisture, possibly in combination with other causes, induces darkness, and dryness induces the light forms.

Again, "*P. myrionna* proves that the *atalanta*-form tendency is strongly inherent also in the *cardui*-form," but surely if, as is surmised, both species (and I would say others too that I shall mention a little later on) came from the same prototype, we should expect the same tendency in all, the point that would be of special interest would be the development of those species that had gone away from the original stirps, and here I would suggest that an aberration is an individual flying off at a tangent from the parent form rather than a "dependent."

I am rather at a loss to understand why Mr. Reuss places *itea* and *gonerilla* in the same category—apart from the fact that the one occurs in Australia and the other in New Zealand, and so to the man in the street they ought to have something in common, I do not say they ought to experts—to my eyes they are as far apart, specifically, as two species of the genus could be if we take colour and pattern as the standard, and this is what Mr. Reuss is theorising on. This brings me to my last point. Why have the species belonging to the Ethiopian region been left out altogether; *abyssinica* for instance, or *hipponene*? The latter is most important of all for it is the transitional species between *P. cardui* and *P. atalanta*. It is true that it is placed now in the genus *Hypanartia*, it

has a short broad tail, but it is a Pyrameid in everything else, on the upperside it is very close to *P. atalanta*, with the red changed to yellow in both wings, but with two ocellated spots by the tail of the secondaries, whilst the underside of the secondaries is in pattern a transition between *P. cardui* and *P. atalanta*. The other species of the genus are not so close, but tend to show the line of development, if indeed *hippomene* may not be nearer the generic prototype. I am led to pen these reflections not in any spirit of controversy, for we need theorists, and the paper in question betokens much thought, but when we theorise the scientific mind should be most careful to make its theories centre round the facts, and not turn the facts to centre round its theories.

Notes on *Agriades thetis* (bellargus).

By G. C. C. HODGSON, M.D.

I have just been able to look through the recently-published account by Mr. Tutt on *Agriades thetis* (*A Nat. Hist. of Brit. Lep.*, x., pp. 331-333), and offer the following remarks on some of the points raised, based on the British material in my own collection.

♂ *AB. VIRIDESCENS*, TUTT.—All the forms show, and the greenish ones to a marked extent, the presence of scales of more than one tint. In the greenish specimens, the green scales are of a pale emerald. A wash of emerald-green water colour "scumbled" over the mixture of cœrulean and ultramarine just reproduces the effect. The best examples in my series come from Lewes (2), Reigate (1), Dover (1), while many others not quite so marked come from Dover and Folkestone, with a few from Surrey and Lewes. One from Wrotham in a friend's collection about equals the best of mine. They occur mostly in the first brood, but some are second brood examples.

DOUBTFUL PATHOLOGICAL EXAMPLES.—In wet seasons (*e.g.*, 1904 1st brood, 1907 1st brood, 1909 2nd brood, especially) I have netted blue males showing patches or spots or lines of purple, quite distinct from the purplish patches observed in bleached specimens. In one of these the patches are quite symmetrically arranged on the right and left wings.

LOCAL COLOUR VARIATION.—In one locality near Lewes, there is a tendency for the ♂ to become darkened to a blackish-blue violet or to a blackish-greenish blue. These examples often show dusky or smoky fringes in which the usual darker patches are obscured. There are always obtainable on this ground, more commonly and regularly than elsewhere observed, specimens of a deepish pure blue colour. All these aberrations just mentioned are, in my mind, particularly associated with August specimens. The conditions, whatever they may be, which give such abundance of *A. thetis* in the August brood, seem to afford a larger percentage. Occasionally (especially in August, 1906) specimens occur of ♀s with dusky fringes, and always both ♂s and ♀s are to be found with heavily marked fringes.

♂s WITH FRINGES APPROACHING PLAIN=*ab. HYACINTHUS*, LEWIN.—In the seven specimens of this form in my collection, twenty-two striae fail to extend through the width of the fringe. In one example, the failure is in the inner half of the fringe opposite four of the nervures of the right upper wing, thus leaving four detached blotches